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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
MAKOTO NAKAMURA, ET AL. : EXAMINER: BARRERA, R. M.
SERIAL NO: 10/820,052 :
FILED: APRIL 8, 2004 : GROUP ART UNIT: 2832
FOR: LONG MAGNET, PRODUCTION :
METHOD THEREOF, MAGNET ROLLER
AND IMAGE FORMING DEVICE

AMENDMENT UNDER 37 C.F.R. §1.312

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Please amend the above-identified application under the provisions of 37 C.F.R.

§1.312 as follows:

Amendments to the Claims are reflected in the listing of claims which begins on
page 2 of this paper.

Remarks/Arguments begin on page 9 of this paper.

IN THE CLAIMS

Claim 1 (Original): A long magnet comprising:
a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent; and
a reinforcing member to reinforce the magnet block, at least part of the reinforcing member being arranged inside of the magnet block.

Claim 2 (Original): The long magnet according to claim 1, wherein the reinforcing member is made of metal.

Claim 3 (Original): The long magnet according to claim 1, wherein the reinforcing member is made of magnetic material.

Claim 4 (Original): The long magnet according to claim 1, wherein the reinforcing member is made of magnet material.

Claim 5 (Original): The long magnet according to claim 1, wherein the reinforcing member is made of flexible material.

Claim 6 (Original): The long magnet according to claim 5, wherein the flexible material contains magnetic powder.

Claim 7 (Original): The long magnet according to claim 6, wherein the magnetic powder is rare earth-type magnetic powder.

Claim 8 (Original): The long magnet according to claim 1, wherein the reinforcing member is composed of two or more materials.

Claim 9 (Original): The long magnet according to claim 1, wherein a flexural strength of the reinforcing member is higher than that of the magnet block.

Claim 10 (Currently Amended): The long magnet according to claim 1, wherein the reinforcing member has a same length as that of a longitudinal direction of the magnet block and is arranged to cover the whole length of the longitudinal direction of the magnet block.

Claim 11 (Original): The long magnet according to claim 1, wherein a plurality of the reinforcing members are provided and arranged discontinuously in a longitudinal direction of the magnet block.

Claim 12 (Original): The long magnet according to claim 1, wherein a plurality of the reinforcing members are provided and arranged inside of the magnet block in a layer structure.

Claim 13 (Original): The long magnet according to claim 1, wherein protrusions are formed on the reinforcing member and the protrusions intrude into the magnet block.

Claim 14 (Original): The long magnet according to claim 1, wherein the reinforcing member is formed in a mesh-like form.

Claim 15 (Original): The long magnet according to claim 1, wherein the reinforcing member is made of a film-like material.

Claim 16 (Currently Amended): A long magnet comprising:
a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent; and
a plurality of reinforcing members to reinforce the magnet block, at least one of the reinforcing ~~member~~members being arranged on one side of a longitudinal direction of the magnet block.

Claim 17 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing ~~members~~ member is made of metal.

Claim 18 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing ~~members~~ member is made of magnetic material.

Claim 19 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing ~~members~~ member is made of magnet material.

Claim 20 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing ~~members~~ member is made of flexible material.

Claim 21 (Original): The long magnet according to claim 20, wherein the flexible material contains magnetic powder.

Claim 22 (Original): The long magnet according to claim 21, wherein the magnetic powder is rare earth-type magnetic powder.

Claim 23 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing members ~~member~~ is composed of two or more materials.

Claim 24 (Currently Amended): The long magnet according to claim 16, wherein a flexural strength of the at least one of the reinforcing members ~~member~~ is higher than that of the magnet block.

Claim 25 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing members ~~member~~ has a same length as that of the longitudinal direction of the magnet block and is arranged to cover the whole length of the longitudinal direction of the magnet block.

Claim 26 (Currently Amended): The long magnet according to claim 16, wherein ~~at~~ the plurality of the reinforcing members are provided and arranged discontinuously in the longitudinal direction of the magnet block.

Claim 27 (Currently Amended): The long magnet according to claim 16, wherein ~~at~~ the plurality of the reinforcing members are provided and arranged inside of the magnet block in a layer structure.

Claim 28 (Currently Amended): The long magnet according to claim 16, wherein protrusions are formed on the at least one of the reinforcing members ~~member~~ and the protrusions intrude into the magnet block.

Claim 29 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing members ~~member~~ is formed in a mesh-like form.

Claim 30 (Currently Amended): The long magnet according to claim 16, wherein the at least one of the reinforcing members ~~member~~ is made of a film-like material.

Claim 31 (Currently Amended): The long magnet according to claim 16, wherein a surface of the at least one of the reinforcing members ~~member~~ that makes a contact with the magnet block is rough.

Claim 32 (Currently Amended): The long magnet according to claim 16, wherein ends of the least one of the reinforcing members ~~member~~ of the longitudinal direction of the magnet block are made thicker than a middle portion thereof.

Claim 33 (Original): The long magnet according to claim 16, wherein ends of the longitudinal direction of the magnet block are made thinner than a middle portion thereof.

Claim 34 (Currently Amended): A manufacturing method of a long magnet, comprising:

mixing of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax and charge control agent into a mixture; and

molding a reinforcing member integrally with the mixture in a mold by compression molding.

Claim 35 (Currently Amended): A magnet roller comprising:

a plastic magnet formed in a shape of a cylinder and having a groove that extends in a longitudinal direction of the plastic magnet; and

a long magnet arranged and fixed to the groove, wherein the long magnet includes

a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent[[;]], and

a reinforcing member to reinforce the magnet block, at least part of the reinforcing member being arranged inside of the magnet block.

Claim 36 (Currently Amended): A magnet roller comprising:

a plastic magnet formed in a shape of a cylinder and having a groove that extends in a longitudinal direction of the plastic magnet; and

a long magnet arranged and fixed to the groove, wherein the long magnet includes

a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent[[;]], and

a plurality of reinforcing members to reinforce the magnet block, at least one of the reinforcing members ~~member~~ being arranged on one side of a longitudinal direction of the magnet block.

Claim 37 (Currently Amended): An image forming apparatus comprising:

a developing unit that includes a magnet roller including

- a plastic magnet formed in a shape of a cylinder and having a groove that extends in a longitudinal direction of the plastic magnet[[]], and
- a long magnet arranged and fixed to the groove, wherein the long magnet includes
 - a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent[[]], and
 - a reinforcing member to reinforce the magnet block, at least part of the reinforcing member being arranged inside of the magnet block; and
 - a nonmagnetic sleeve that is arranged on an outer periphery of the magnet roller.

Claim 38 (Currently Amended): An image forming apparatus comprising:

a developing unit that includes a magnet roller including

- a plastic magnet formed in a shape of a cylinder and having a groove that extends in a longitudinal direction of the plastic magnet[[]], and
- a long magnet arranged and fixed to the groove, wherein the long magnet includes
 - a magnet block made of a mixture of rare earth magnetic powder, thermoplastic resin particles, fluidity additive, pigment, wax, and charge control agent[[]], and
 - a plurality of reinforcing members to reinforce the magnet block, at least one of the reinforcing members ~~member~~ being arranged on one side of a longitudinal direction of the magnet block; and
 - a nonmagnetic sleeve that is arranged on an outer periphery of the magnet roller.

REMARKS/ARGUMENTS


Applicants acknowledge with appreciation the allowance of Claims 1-38. The present amendment amends Claims 10, 16-20, 23-32, and 34-38.

The present amendment corrects minor informalities uncovered during a post allowance review of the present application. No new matter is added, and no new search is required. The Amendment is believed to be clearly directed to only matters of form and should, accordingly be entered.

Accordingly, entry of this amendment prior to issuance is respectfully requested.

Respectfully submitted,

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